

1. Introduction

- Glycemic control during liver transplantation can be challenging, especially after reperfusion of the liver graft.
- Numerous confounding factors make it difficult to predict glucose response to insulin during liver transplantation surgery.

2. Methods

- Retrospective analysis of 13-years of data to determine the relationship between the insulin dose and blood glucose levels in liver transplantation.

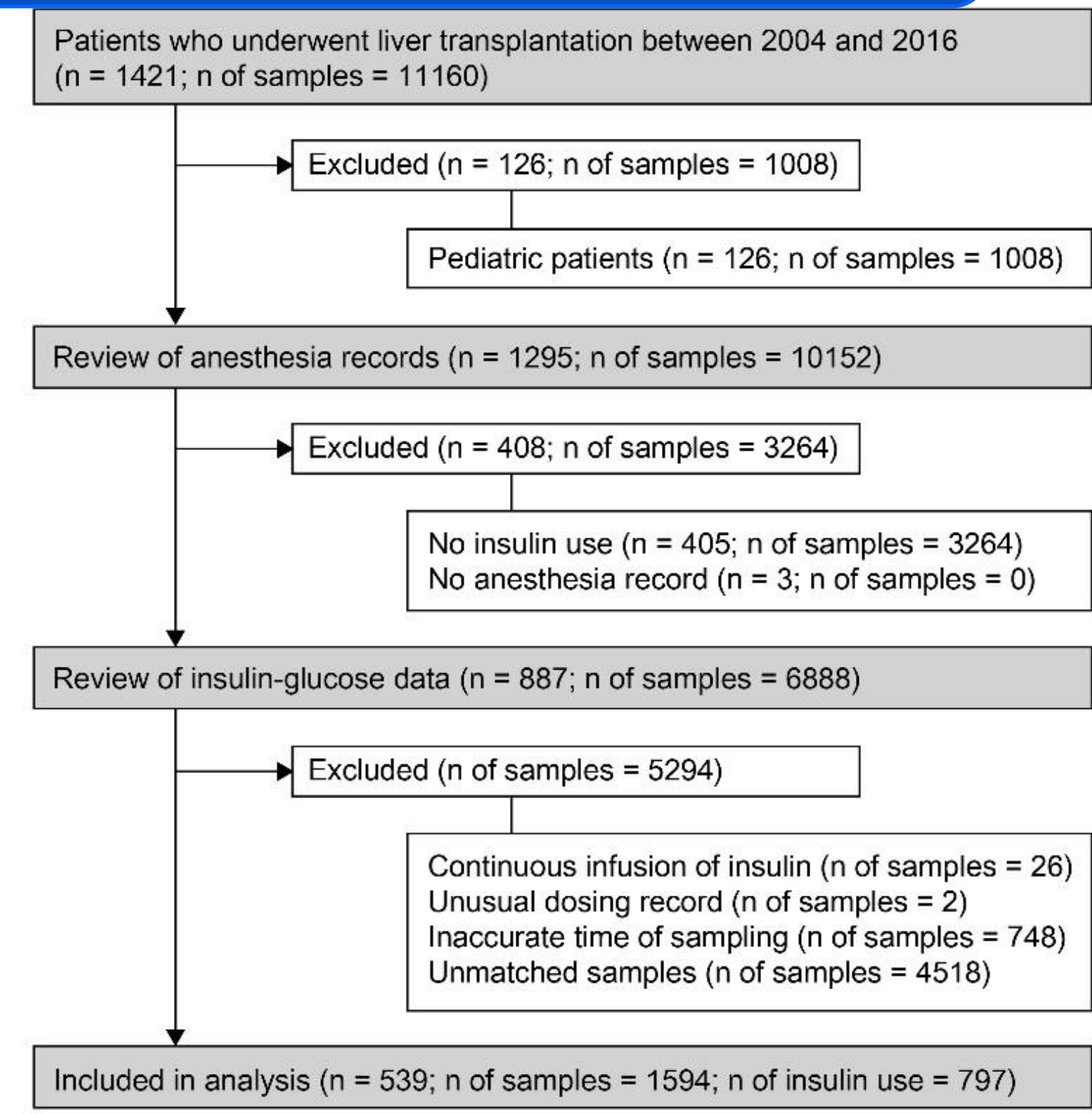


Figure 1. Flow diagram of study

3. Results

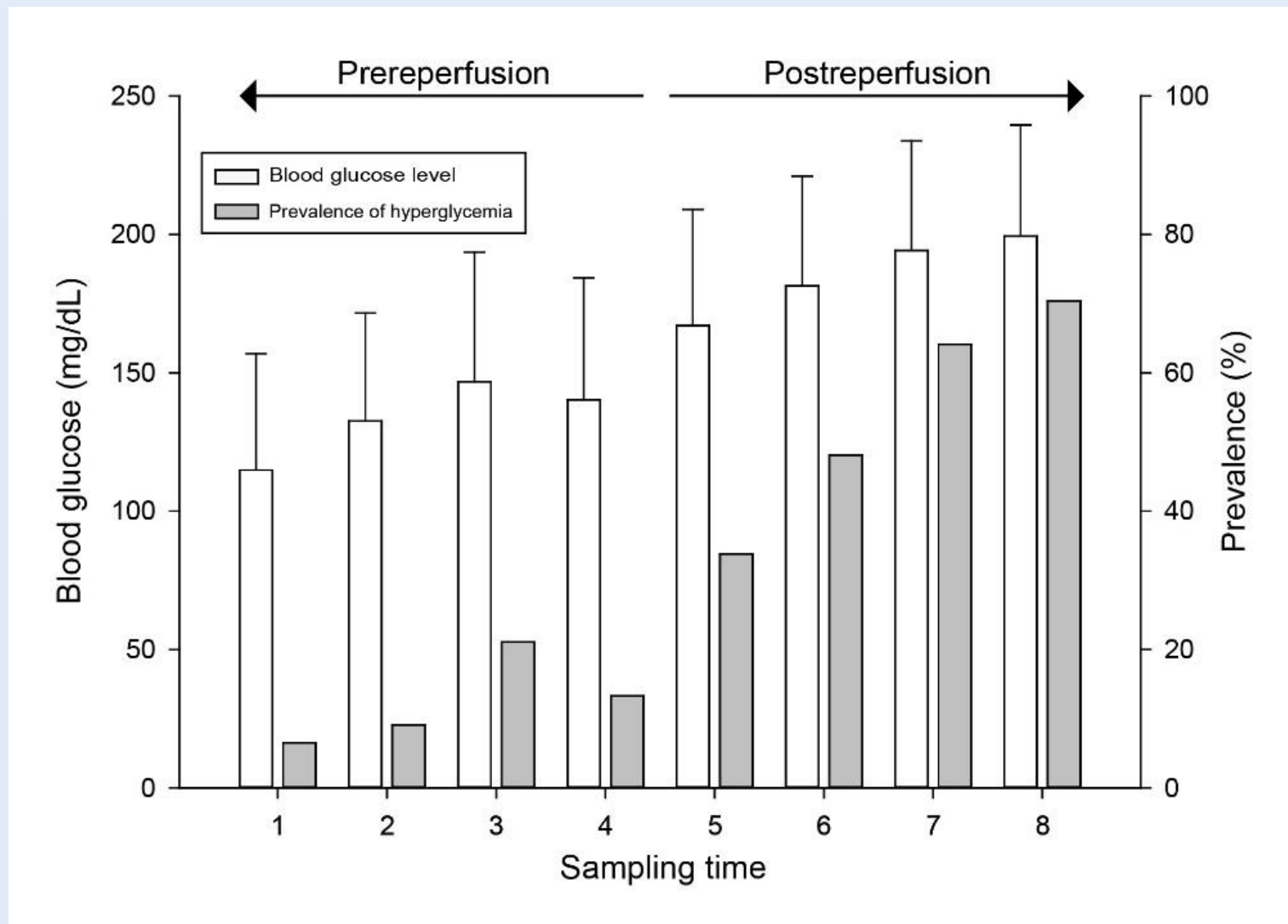


Figure 2. Degree and prevalence of hyperglycemia during liver transplantation (n = 1395 samples)

Hyperglycemia was more common and severe in the postreperfusion period than in the prereperfusion period.

Figure 3. Insulin dose-response plots during postreperfusion periods in patients with and without DM

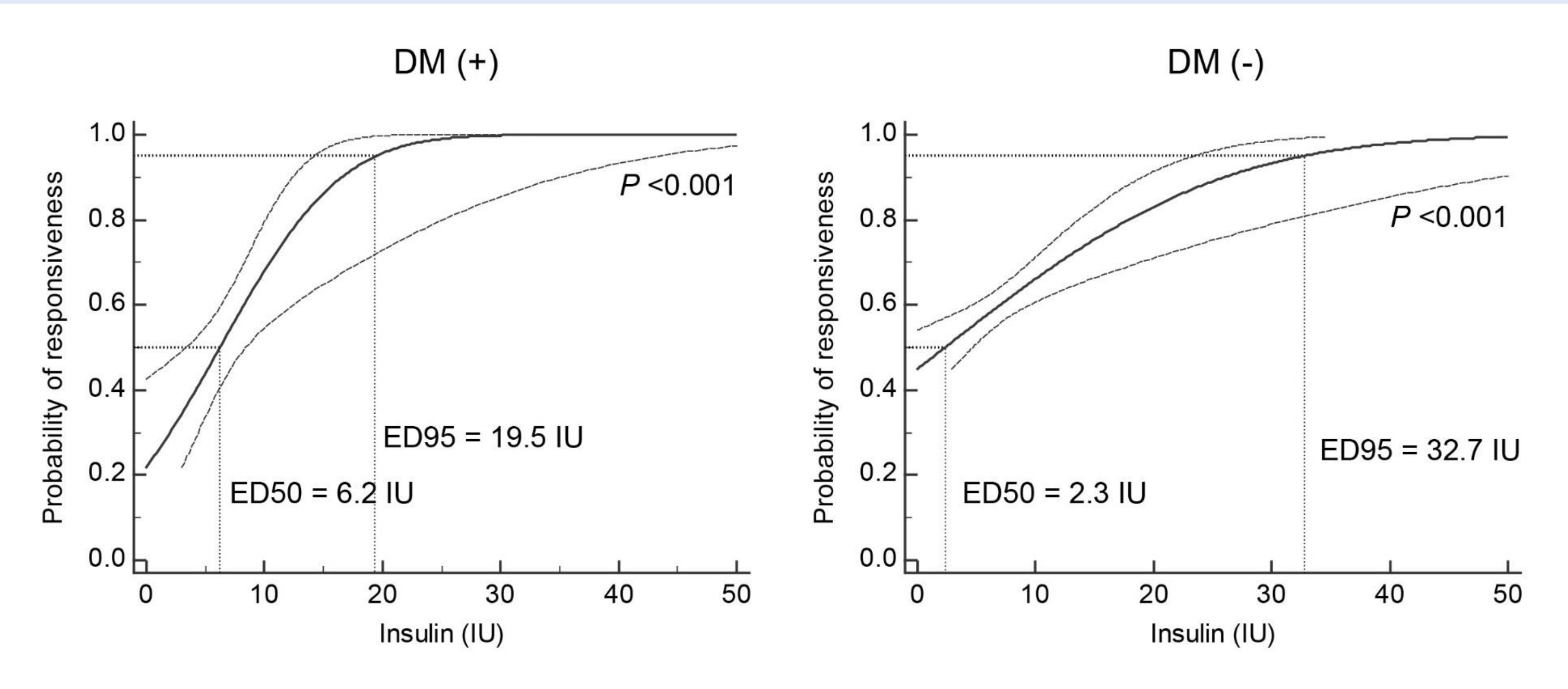


Table 1. Comparison between insulin responsive and insulin resistant groups

	Insulin responsive (n = 387)	Insulin resistant (n = 243)	ASD
No of insulin use	498	299	0.341
Prereperfusion period (%)	125 (15.7%)	36 (4.5%)	
Postreperfusion period (%)	373 (46.8%)	263 (33.0%)	
Gender (M/F)	278/109	188/55	0.092
Age (years)	59 (54, 64)	59 (54, 65)	0.013
Weight (kg)	61 (54, 69)	60 (53, 68)	0.044
History of diabetes mellitus	72 (18.6%)	51 (21.0%)	<0.001
Preoperative insulin use	20 (5.2%)	13 (5.3%)	0.100
Erythrocytes transfusion (units)	7 (3, 14)	8 (4,14)	0.071
Prereperfusion/postreperfusion	219 (205, 245)	213 (200, 228)	0.258
Glucose before treatment (mg/dL)	198 (179, 223)	228 (213, 250)	0.782
Glucose after treatment (mg/dL)	6 (5, 10)	5 (4, 10)	0.357
Insulin dose (IU)	110 (70, 160)	90 (60, 140)	0.32
Insulin dose/Wt (mIU/kg)	40 (28, 50)	36 (23, 50)	0.203
Sampling interval (min)	20 (10, 36)	-13 (-27, -5)	1.847
Δglucose (mg/dL)	2.7 (1.3, 5.2)	-2.3 (-5.1, -0.7)	1.381
Δglucose/unit insulin (mg/dL/IU)	278/109	188/55	0.341

Table 2. Multiple linear regression to predict blood glucose change after insulin administration in the insulin responsive group

Variables	Coefficient	Standard Error	R _{partial}	P-value
Postreperfusion period	-20.1	2.0	-0.4	<0.001
History of diabetes mellitus	-7.0	2.2	-0.1	0.002
Pretreatment glucose (mg/dL)	0.2	0.0	0.3	<0.001
Sampling interval (min)	0.3	0.1	0.2	<0.001
Insulin dose (IU)	0.4	0.2	0.1	0.049
Constant	-10.5			

- Assumption:
glucose target of 180 mg/dL & sampling interval of 20 minutes

→ a simple formula of glycemic control during postreperfusion period was derived as follows:

Glucose reduction (mg/dL) =
11.4 + 0.4 x insulin dose (IU) – 7.0 x history of DM
(neg = 0, pos = 1)

4. Conclusion

- Commonly administered doses of insulin seem mostly inadequate to treat postreperfusion hyperglycemia.
- Our findings will help establish guidelines to treat refractory hyperglycemia during liver transplantation.